

PATENT APPLN. NO. 10/544,210
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

REMARKS

Claims 19-21 of the application are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Biensan et al., US 6,071,645 ("Biensan").

Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Biensan in view of Miyasaka, US 5,478,674 A.

Claim 23 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Biensan in view of Iwasaki et al., JP 09-293536.

Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Biensan in view of Tanaka, US 5,487,960.

Claim 25 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Biensan in view of Hironaka, US 2001/0031391.

These rejections are not proper because the primary reference Biensan is insufficient to support anticipation or obviousness of the nonaqueous electrolyte secondary battery recited in claims 19-21. The patentability of claims 22-25 is related to the patentability of claim 19 in view of the fact that each of claims 22-25 depends on claim 19. Since claim 19 is patentable, claims 22-25 are prima facie patentable.

Referring to the rejection of claims 19-21, the position of the Office regarding anticipation is that the product of Biensan is inherently the same as that of the present invention "given that

PATENT APPLN. NO. 10/544,210
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

the materials and method for producing (sintering and mixing) disclosed by BIENSAN et al. and the present application have the same composition and steps." (Action, page 3, last line, to page 4, line 1).

The position of the Office as quoted above is not correct. Biensan nowhere directs a person of ordinary skill in the art to the specific selection of lithium cobaltate (together with the specific selection of Mg as the element A and Zr as the at least one element D of groups 4b to 5a of the periodic table) as the positive electrode active material. In the examples of Biensan only lithium nickel oxides are disclosed and Zr is not disclosed for use as the element D. To support anticipation under 35 U.S.C. § 102, a claim limitation or claim limitations must necessarily be included in the prior art reference. Inherency may not be established by possibilities or probabilities. Therefore, Biensan does not place the claimed nonaqueous electrolyte secondary battery including each of the limitations recited in claims 19-21 in the hands of the public and does not support anticipation under 35 U.S.C. § 102(b) of claims 19-21.

Moreover, the position of the Office regarding inherency is expressly rebutted by the description in Biensan of the element D as a doping element which substitutes for a portion of the

PATENT APPLN. NO. 10/544,210
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

transition metal which defines the structure of the material (Col. 1, lines 57-59). Therefore, the doping metal is not present as a compound existing in the form of particles sintered with particle surfaces of the lithium transition metal oxide and being detected in the particles of the compound but not detected in the lithium lithium transition metal oxide particles as required by claims 19-21.

Biensan is also insufficient to suggest a nonaqueous electrolyte secondary battery in which the positive electrode active material is lithium cobaltate in which Zr and Mg are contained in a total amount of not greater than 3 mole %, based on the total amount of the these elements and cobalt present in the lithium cobaltate; a Zr-containing compound exists in the form of particles sintered with particle surfaces of the lithium cobaltate; and Zr is detected in the particles of the Zr-containing compound but not detected in the lithium cobaltate particles.

Notwithstanding the inclusion of Zr in the list of possible doping elements D, a person of ordinary skill in the art would not have reasonably expected Zr to function as a doping element which substitutes for a portion of the transition metal which defines the structure of the material as required in the active material of Biensan and would not have chosen Zr as one of the at least doping

PATENT APPLN. NO. 10/544,210
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

elements D for use in combination with lithium cobaltate and Mg.

Zr would not have been reasonably expected to substitute for a portion of the transition metal because of its larger ion radius. The ion radiuses of Zr, other metals described as the metal D in the examples of Biensan, and the transition metals (i.e., Co, Ni and Mn) are as follows:

Zr⁴⁺ : 0.79 Å

Al³⁺ : 0.54 Å

Sn⁴⁺ : 0.69 Å

Ti⁴⁺ : 0.61 Å

Co³⁺ : 0.55 Å

Ni³⁺ : 0.56 Å

Mn³⁺ : 0.58 Å

As can be seen, the ion radius of Zr is larger than those of the transition metals, while Al, Sn and Ti have ion radiuses close to those of the transition metals. Zr would have been expected to be difficult to substitute for a portion of the transition metal due to its larger ion radius.

For this reason, Biensan does not provide a proper motive for the person of ordinary skill in the art to select Zr for use in combination with lithium cobaltate and Mg in the lithium electrode of Biensan and does not support a case of prima facie obviousness

PATENT APPLN. NO. 10/544,210
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

of claims 19-21 under 35 U.S.C. § 103(a).

Moreover, the comparative data of the present application demonstrate unexpected results for the use of the positive electrode active material of the present invention in a nonaqueous electrolyte secondary battery.

In the examples of Biensan, only lithium nickel oxides are disclosed and lithium cobalt oxide is not disclosed. Biensan discloses lithium nickel oxide containing Mg and Ti (Battery IV) shown in Tables I and II. As shown in Table 2 of the present application, lithium cobalt oxide containing Mg and Ti (Battery A5) and lithium cobalt oxide containing Mg and Zr (Battery A1) (according to the present invention) are used as positive electrode active materials. As understood from the results for capacity retention after 250 cycles shown in Table 2, the combination of Mg and Zr in lithium cobalt oxide provides unexpectedly improved charge-discharge cycle characteristics compared with the combination of Mg and Ti.

The comparative data are evidence of the non-obviousness of the nonaqueous electrolyte secondary battery of the present invention as recited in claims 19-21 and the claims dependent on claim 19, claims 22-25.

Withdrawal of the 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a)

PATENT APPLN. NO. 10/544,210
RESPONSE UNDER 37 C.F.R. §1.111

PATENT
NON-FINAL

rejections of the claims is in order and is respectfully requested.

The foregoing is believed to be a complete and proper response to the Office Action dated July 20, 2009, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 111833.

In the event any additional fees are required, please also charge our Deposit Account No. 111833.

Respectfully submitted,
KUBOVCIK & KUBOVCIK



Ronald J. Kubovcik
Reg. No. 25,401

Crystal Gateway 3
Suite 1105
1215 South Clark Street
Arlington, VA 22202
Tel: (703) 412-9494
Fax: (703) 412-9345
RJK/ff